This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-164. (Cancelled)

165. (Currently Amended) A computer implemented method for relating a price or value of a plurality of securities associated with an underlying asset, [[the]] a rate of return on said securities and [[the]] risk attributes of said securities, the method comprising the steps of:

determining a risk premium incorporated in the rate of return for each security;

designating that a priced risk factor incorporated in the risk premium for each security is ~~the~~ volatility ~~of returns~~, measured over discrete time, and that [[the]] a price per unit of this risk factor is the same for two or more of the said securities; and

defining a financial model ~~comprising data~~ representing at least one relationship[[s]] between the risk premiums determined for each security; and

storing the financial model in a computer memory.

166. (Previously presented) The computer implemented method of claim 165, wherein at least one of said plurality of securities is a debt-type instrument, and further comprising analysing a yield spread associated with the debt-type instrument and identifying a default loss component and a risk premium component of said yield spread.

167. (Previously presented) The computer implemented method of claim 165, further comprising fitting the model.

168. (Previously presented) The computer implemented method of claim 167, further comprising providing as output to a user parameters of the fitted model.

169. (Currently Amended) The computer implemented method of claim 165, wherein [[the]] a rate of return for a security (or securities) issued by, or referenced to, a firm is analysed utilising

an estimate of [[the]] an expected default loss of another~~, debt-type~~ security that is of a debt-type (security *j*) issued by, or referenced to, the firm, the method further comprising the steps of:

determining [[the]] a rate of return on security *j* (r_j) by reference to [[the]] a promised yield on said security (y_j) and the expected default loss (EDL_j) on said security where:

$$r_j = y_j - EDL_j$$

calculating [[the]] an excess return for said security *j* as equal to $r_j - r$, where *r* is [[the]] a risk free rate of return;

calculating [[the]] an exposure of each security to each priced risk factor (*m*);

calculating a price per unit of risk (λ_m) for each priced risk factor (*m*) in which each λ_m is the same for two or more securities issued by, or referenced to, the firm and such that the sum of the products of the risk exposures for security *j* and the prices per unit of risk equals the excess return for security *j*, and similarly for any other security for which an estimate of the excess return is available;

designating that one of the priced risk factors relates to [[the]] a volatility, estimated over a discrete time period, of the rate of return on securities ~~estimated over a discrete time period~~ and is specific to securities issued by, or referenced to, the firm;

calculating [[the]] an excess rate of return for all ~~of the~~ other securities being analysed, other than *j*, based at least partly on their exposure to each priced risk factor and the price per unit of risk for each risk factor;

fitting the model; and

providing as output to a user parameters of interest to the user from the fitted model.

170. (Currently Amended) The computer implemented method of claim 169, wherein the only priced risk factor comprises the volatility of returns and is implemented by:

designating the relationship between [[the]] a firm specific price of volatility risk (λ_σ), the rate of return for *j* (r_j), the volatility of returns for *j* (σ_j) and the risk free rate of return (*r*) as:

$$\lambda_\sigma = \frac{r_j - r}{\sigma_j}$$

designating [[the]] a rate of return (r_k) on another class, or classes, of security (k) issued by, or referenced to, the firm as:

$$r_k = r + \lambda_\sigma \sigma_k$$

designating, where security class or classes k are debt-type securities, [[the]] a default loss on said securities by combining the promised yield on said securities (y_k) and their rate of return (r_k) as follows:

$$EDL_k = y_k - r_k$$

fitting the model; and

providing as output to a user parameters of interest from the fitted model.

171. (Withdrawn) A computer implemented method of measuring the credit risk of an asset, the method comprising the steps of:

receiving data representative of the said asset and data representative of another asset;

determining an estimate of the covariance of the two assets; and

generating a measure of the credit risk of the said asset corresponding to the said estimate of covariance.

172. (Withdrawn) The computer implemented method of claim 171, wherein the two assets are securities issued by, or referenced to, the same firm and using said covariance output as a measure of credit risk of the security that ranks highest in priority upon a liquidation or default event.

173. (Withdrawn) A computer implemented method of estimating the covariance of returns for that security and another security issued by, or referenced to, the same firm wherein the first security ranks higher in priority upon a liquidation or default event, the method comprising the steps of:

receiving data representative of the first security;

determining an estimate of the expected default loss of said first security; and

generating a measure of the covariance of the two said securities corresponding to the expected default loss of the first said security.

174. (Withdrawn) The computer implemented method of claim 172, wherein the annualised expected default loss (EDL_j) on one of the said securities, security j, is designated as:

$$EDL_j = \ln\left(\rho_{jk} \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)} + 1 \right) \Big/ T$$

where:

j is the class or classes of the firm's debt-type or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

ρ_{jk} is the correlation coefficient of the rates of return for j and k;

the model is fitted; and

parameters of interest from the fitted model are output to a user.

175. (Withdrawn) The computer implemented method of claim 173, wherein the annualised expected default loss (EDL_j) on one of the said securities, security j, is designated as:

$$EDL_j = \ln\left(\rho_{jk} \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)} + 1 \right) \Big/ T$$

where:

j is the class or classes of the firm's debt-type or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

ρ_{jk} is the correlation coefficient of the rates of return for j and k;

the model is fitted; and

parameters of interest from the fitted model are output to a user.

176. (Withdrawn) The computer implemented method of claim 171, wherein the annualised expected default loss (EDL_j) on one of the said securities, security j, is designated as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

the model is fitted; and

parameters of interest from the fitted model are output to a user.

177. (Withdrawn) The computer implemented method of claim 172, wherein the annualised expected default loss (EDL_j) on one of the said securities, security j, is designated as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

the model is fitted; and

parameters of interest from the fitted model are output to a user.

178. (Withdrawn) The computer implemented method of claim 173, wherein the annualised expected default loss (EDL_j) on one of the said securities, security j, is designated as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

the model is fitted; and

parameters of interest from the fitted model are output to a user.

179. (Withdrawn) The computer implemented method of claim 171, wherein the two assets are portfolios or indices in respect of different types of security and using said covariance output as a measure of credit risk.

180. (Withdrawn) A computer implemented method for estimating the correlation of returns for two securities issued by, or referenced to, a firm, the method comprising the steps of:

receiving data representative of the two securities;

determining an estimate of the variance of each of the said securities;

determining an estimate of the expected default loss of one of the said securities; and

generating a measure of the correlation of the two securities by relating the said estimates of the variance the said estimate of expected default loss.

181. (Withdrawn) The computer implemented method of claim 180, wherein the correlation (ρ_{jk}) of the returns for the two said securities, j and k, is designated as:

$$\rho_{jk} = EDL_j T \Big/ \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)}$$

where:

j is the class or classes of the firm's debt or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

EDL_j the annualised expected default loss on security j;

the model is fitted; and

parameters of interest from the fitted model are output to a user.

182. (Withdrawn) The computer implemented method of claim 180, wherein the correlation (ρ_{jk}) of the returns for two said securities *j* and *k*, is designated as:

$$\rho_{jk} = EDL_j / \sigma_j \sigma_k \ ;$$

the model is fitted; and

parameters of interest from the fitted model are output to the user.

183. (Currently Amended) The computer implemented method of claim 165, wherein one or more of the securities is an option, the method further comprising the steps of:

specifying [[the]] a real world distribution process that [[the]] returns on the underlying asset are expected to follow;

receiving data on features of the option;

receiving adjustments for any factors specified by a user;

calculating [[the]] an expected real world probability of the option being exercised based on the real world distribution process and the option's features;

calculating [[the]] an expected mean, standard deviation and other higher moments of interest of the option, at the time the option is expected to be exercised;

using the expected mean value of the option, at the time the option is expected to be exercised, and the option's features ~~aforesaid parameters~~ to calculate [[the]] an expected real world pay off from the option;

discounting back to present value (as at the chosen evaluation date) the pay off from the option using a risk adjusted discount rate, where said risk adjusted discount rate includes a risk premium for the expected standard deviation (measured over discrete time) of the expected option pay off, for such other higher moments of interest to the user and adjustments for any other factors specified by a user, such that the price per unit of risk, for each risk factor, is equated for two or more assets or securities selected from the options being evaluated, the underlying asset and any other securities of interest referenced thereto; and

providing as output to a user parameters of interest to the user from the fitted model.

184. (Previously presented) The computer implemented method of claim 183, further comprising the step of using the estimated values for the rate of return, standard deviation, other higher moments of interest and any other factors specified by a user for the asset as input to price or value other options contingent on the same or similar assets.

185. (Currently Amended) The computer implemented method of claim 165, wherein a user applies an option-theoretic model of the firm, the method further comprising the steps of:

determining a plurality of input parameters, the parameters including a risk premium in the rate of return for each security issued by, or referenced to, the firm;

defining relationships between said parameters;

fitting the model; and

providing as output to a user parameters of interest to the user from the fitted model.

186. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of:

receiving data on features of the securities issued by, or referenced to, the firm;

receiving adjustments for any factors specified by a user;

specifying [[the]] a real world distribution process that the returns on the firm's assets are expected to follow;

specifying a default point representing the value of the firm's assets at which the firm is expected to default;

calculating [[the]] an expected real world probability of the default point being met;

calculating [[the]] an expected mean, standard deviation and other higher moments of interest of the securities being analysed, having regard to the real world distribution process modelled for the firm's assets and the default point, at [[the]] a time horizon of interest;

using the expected mean value of the securities, at the time horizon of interest, and the securities' features ~~aforesaid parameters~~ to calculate [[the]] an expected real world pay off of the securities being analysed, at the time horizon of interest;

discounting back to present value (as at [[the]] a chosen evaluation date) the expected pay offs of each security being analysed using a risk adjusted discount rate, where said risk adjusted discount rate includes a risk premium for the expected standard deviation of the expected pay off from the security, for such other higher moments of interest to the user and adjustments for any other factors specified by a user, such that [[the]] a price per unit of risk, for each such risk factor, is equated for two or more securities issued by, or referenced to, the firm;

fitting the model; and

providing as output to a user parameters of interest to the user from the fitted model.

187. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of:

defining additional multi-variate equations representing relationships between variables, which comprise some or all of the inputs to and/or outputs from ~~variables used in~~ the model of claim 185; and

solving all of the multi-variate equations and the said model to calculate revised values for the ~~remaining unknown~~ variables in the multi-variate equations and the model.

188. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents a statistical moment of one of the securities issued by, or referenced to the firm.

189. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents [[the]] a correlation between the returns of a pair of securities issued by, or referenced to, the firm.

190. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations

comprises or represents [[the]] a covariance between the returns of a pair of securities issued by, or referenced to, the firm.

191. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents [[the]] a correlation between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

192. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents [[the]] a covariance between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

193. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents [[the]] an expected probability of default.

194. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents an [[the]] expected loss given default on a debt-type security issued by, or referenced to, the firm.

195. (Currently Amended) The computer implemented method of claim 187, wherein at least one of the variables ~~unknown inputs~~ included in one or more additional multi-variate equations comprises or represents [[the]] an expected default loss on a debt-type security issued by, or referenced to, the firm.

196. (Previously presented) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said

parameters is a statistical moment of the returns of one of the securities issued by, or referenced to, the firm.

197. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a correlation between the returns of a pair of securities issued by, or referenced to, the firm.

198. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a covariance between the returns of a pair of securities issued by, or referenced to, the firm.

199. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a correlation between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

200. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a covariance between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

201. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the

model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected probability of default.

202. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected loss given default on a debt-type security issued by, or referenced to, the firm.

203. (Currently Amended) The computer implemented method of claim 185, further comprising the steps of generating one or more parameters from the model and solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected default loss on a debt-type security issued by, or referenced to, the firm.

204. (Currently Amended) The computer implemented method of claim 183, wherein the real world distribution process that the returns on the firm (or underlying asset) are expected to follow is modelled as a specified statistical distribution, wherein the mean, standard deviation and other higher moments of interest of [[the]] portions of that distribution relevant to a security are estimated using closed-form type formula solutions or numerical approximations appropriate for the specified statistical distribution process.

205. (Currently Amended) The computer implemented method of claim 186, wherein the real world distribution process that the returns on the firm (or underlying asset) are expected to follow is modelled as a specified statistical distribution, wherein the mean, standard deviation and other higher moments of interest of [[the]] portions of that distribution relevant to a security are estimated using closed-form type formula solutions or numerical approximations appropriate for the specified statistical distribution process.

206. (Currently Amended) The computer implemented method of claim 204, wherein the real world ~~statistical~~ distribution process that the returns on the firm (or underlying asset) are expected to follow is the normal distribution.

207. (Currently Amended) The computer implemented method of claim 205, wherein the real world ~~statistical~~ distribution process that the returns on the firm (or underlying asset) are expected to follow is the normal distribution.

208. (Currently Amended) The computer implemented method of claim 207, wherein the firm has, or is treated as having, only a single class of zero coupon debt on issue and ~~the model is fitted such that~~ further comprising the steps of:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a promised yield on the firm's debt, per annum (y),

a risk free rate of return, per annum (r),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

a standard deviation of rates of return on the firm's debt, per annum (σ_B),

a standard deviation of rates of return on the firm's equity, per annum (σ_S);

calculating values for d_1 and d_2, wherein:

$$d_1 = \frac{\left(\left[\ln\left(V_0/X\right) + r_V T\right]/\sigma_V\sqrt{T}\right) + (1/2)\left(\sigma_V\sqrt{T}\right)}{},$$

$$d_2 = d_1 - \sigma_V\sqrt{T};$$

calculating values for:

$$\frac{\ln\left(\frac{V_0 e^{r_V T}\left[1 - N(d_1)\right] + B_0 e^{yT} N(d_2)}{B_0}\right)/T - r}{\sigma_B},\text{and}$$

$$:\frac{\ln\left(\frac{V_0 e^{r_V T} N(d_1) - B_0 e^{yT} N(d_2)}{S_0}\right)/T - r}{\sigma_S}$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 or d_2 as the upper limit; and

fitting the model such that:

$$\frac{\ln\left(\frac{V_0 e^{r_V T}\left[1 - N(d_1)\right] + B_0 e^{yT} N(d_2)}{B_0}\right)/T - r}{\sigma_B} = \frac{\ln\left(\frac{V_0 e^{r_V T} N(d_1) - B_0 e^{yT} N(d_2)}{S_0}\right)/T - r}{\sigma_S}.$$

~~where:~~

~~S_n is a value of the equity of the firm at time *n*,~~

~~V_n is a value of the firm's assets at time *n*,~~

~~*X* is a face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity,~~

~~*T* is a user selected time horizon, in years,~~

~~r_V is a rate of return on the firm's assets, per annum,~~

~~y is the promised yield on the firm's debt, per annum~~

~~$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] / \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T} \right)$$~~

~~$$d_2 = d_1 - \sigma_V \sqrt{T}$$~~

~~$N(.)$ is the cumulative probability of the standard normal distribution with d_1 or d_2 as the upper limit; and~~

~~r is the risk free rate of return, per annum~~

~~σ_V is a standard deviation of rates of return on the firm's assets, per annum,~~

~~σ_B a standard deviation of rates of return on the firm's debt, per annum,~~

~~σ_S is a standard deviation of rates of return on the firm's equity, per annum,~~

209. (Currently Amended) A computer implemented method for applying an option-theoretic model of a firm comprising the steps of specifying values for risk parameters, determining a plurality of input parameters, defining relationships between said input parameters, creating a computer implemented option-theoretic model of the firm, inputting the input parameters to the model, estimating ~~generating~~ one or more risk parameters from the model, measured ~~estimated~~ over a discrete time period, [[and]] solving the model so that the ~~said~~ estimated risk parameters equal the values specified by a user, and storing the solution to the model in a computer memory.

210. (Currently Amended) The computer implemented method of claim 209, wherein one of the said risk parameters is a statistical moment of [[the]] returns of one or more [[of the]] securities issued by, or referenced to, the firm.

211. (Currently Amended) The computer implemented method of claim 209, wherein one of the said risk parameters is [[the]] a correlation between [[the]] returns of a pair of securities issued by, or referenced to, the firm.

212. (Currently Amended) The computer implemented method of claim 209, wherein one of the said risk parameters is [[the]] a covariance between [[the]] returns of a pair of securities issued by, or referenced to, the firm.

213. (Currently Amended) The computer implemented method of claim 209, wherein one of the said risk parameters is [[the]] a correlation between [[the]] returns of a security issued by, or referenced to, the firm and [[the]] returns of the total firm.

214. (Currently Amended) The computer implemented method of claim 209, wherein one of the said risk parameters is [[the]] a covariance between [[the]] returns of a security issued by, or referenced to, the firm and [[the]] returns of the total firm.

215. (Currently Amended) The computer implemented method of claim 185 further comprising the steps of:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a rate of return on the firm's equity, per annum (r_S),

a rate of return on the firm's debt, per annum (r_B),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

calculating a value for d_1, wherein:

$$d_1 = \frac{\left(\left[\ln\left(V_0/X\right) + r_V T\right]/\sigma_V\sqrt{T}\right) + (1/2)\left(\sigma_V\sqrt{T}\right)}{}.$$

calculating a value for an instantaneous standard deviation of rates of return on the firm's debt, per annum (σ_B), using the formula:

$$\sigma_B = \sigma_V \frac{V_0}{B_0} e^{(r_V - r_B)T}\left[1 - N(d_1)\right]$$

;and/or

calculating a value for an instantaneous standard deviation of rates of return on the firm's equity, per annum (σ_S), using the formula:

$$\sigma_S = \sigma_V \frac{V_0}{S_0} e^{(r_V - r_S)T} N(d_1);$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 as the upper limit; and

using one or both said values of instantaneous standard deviation to fit the option-theoretic model of the firm.

~~, wherein the formula for calculating additional parameters, being instantaneous volatility, for calibration with the model comprise:~~

216. (Currently Amended) The computer implemented method of claim 209 further comprising the steps of~~, wherein the formula for calculating additional parameters, being instantaneous volatility, for calibration with the model comprise~~:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a rate of return on the firm's equity, per annum (r_S),

a rate of return on the firm's debt, per annum (r_B),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

calculating a value for d_1, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T} \right),$$

calculating a value for an instantaneous standard deviation of rates of return on the firm's debt, per annum (σ_B), using the formula:

$$\sigma_B = \sigma_V \frac{V_0}{B_0} e^{(r_V - r_B)T} \left[1 - N(d_1) \right]$$

;and/or

calculating a value for an instantaneous standard deviation of rates of return on the firm's equity, per annum (σ_S), using the formula:

$$\sigma_S = \sigma_V \frac{V_0}{S_0} e^{(r_V - r_S)T} N(d_1) ;$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 as the upper limit; and

using one or both said values of instantaneous standard deviation to fit the option-theoretic model of the firm.

217. (Currently Amended) The computer implemented method of claim 185 further comprising the steps of:

receiving user selection of one or more of the following parameters, to be calculated over discrete time, for calibration with the model:

a standard deviation of rates of return on the firm's debt, per annum (σ_B),

a standard deviation of rates of return on the firm's equity, per annum (σ_S),

a correlation of rates of return on the firm's debt and on the firm's equity (ρ_{BS}),

a correlation of rates of return on the firm's assets and on the firm's debt (ρ_{VB}),

a correlation of rates of return on the firm's assets and on the firm's equity (ρ_{VS}),

a covariance of rates of return on the firm's debt and on the firm's equity, per annum (σ_{BS}),

a covariance of rates of return on the firm's assets and on the firm's debt, per annum (σ_{VB}),

a covariance of rates of return on the firm's assets and on the firm's equity, per annum (σ_{VS}),

calculating values for the parameter or parameters so selected using one or more of the following ~~wherein the~~ formula:

$$\sigma_B = \sqrt{\ln\left(\frac{V_T^2[1-N(d_3)]e^{\sigma_V^2 T} + X^2 N(d_2)}{B_T^2}\right)\Big/T}$$

$$\sigma_S = \sqrt{\ln\left(\frac{V_T^2 N(d_3)e^{\sigma_V^2 T} - 2V_T XN(d_1) + X^2 N(d_2)}{S_T^2}\right)\Big/T}$$

$$\rho_{BS} = \frac{X - B_T}{B_T\sqrt{\left(e^{\sigma_S^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VB} = \frac{V_T[1-N(d_3)]e^{\sigma_V^2 T} + XN(d_1) - B_T}{B_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VS} = \frac{V_T N(d_3)e^{\sigma_V^2 T} - XN(d_1) - S_T}{S_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_S^2 T}-1\right)}}$$

$$\sigma_{BS} = \rho_{BS}\sigma_B\sigma_S$$

$$\sigma_{VB} = \rho_{VB}\sigma_V\sigma_B$$

$$\sigma_{VS} = \rho_{VS}\sigma_V\sigma_S$$

where<u>in</u> ~~the additional term is~~:

S_n is a value of the equity of the firm at time *n*,

V_n is a value of the firm's assets at time *n*,

B_n is a value of the debt of the firm at time *n*,

X is a face value of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

T is a user selected time horizon, in years,

r_V is a rate of return on the firm's assets, per annum,

σ_V is a standard deviation of rates of return on the firm's assets, per annum,

σ_S is a standard deviation of rates of return on the firm's equity, per annum,

σ_B is a standard deviation of rates of return on the firm's debt, per annum,

values for d_1, d_2 and d_3 are calculated using the formula:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T},$$

$$d_3 = d_1 + \sigma_V \sqrt{T}.$$

$N()$ is the cumulative probability of the standard normal distribution with d_1, d_2 or d_3 as the upper limit;

prior to calculating values of the selected parameter or parameters, receiving such of the following that are necessary to undertake the said calculations using the said formula:

a value of the equity of the firm at time n,

a value of the firm's assets at time n,

a value of the debt of the firm at time n,

a face value of the firm's debt,

a user selected time horizon, in years,

a rate of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's equity, per annum,

a standard deviation of rates of return on the firm's debt, per annum; and

using one or more of the values of the selected parameters so calculated to fit the option-theoretic model of the firm.

218. (Currently Amended) The computer implemented method of claim 209 further comprising the steps of: ~~wherein the formula for calculating additional parameters, being discrete time volatility, correlation and covariance, for calibration with the model comprise:~~

receiving user selection of one or more of the following parameters, to be calculated over discrete time, for calibration with the model:

a standard deviation of rates of return on the firm's debt, per annum (σ_D),

a standard deviation of rates of return on the firm's equity, per annum (σ_E),

a correlation of rates of return on the firm's debt and on the firm's equity ($\rho_{D,E}$),

a correlation of rates of return on the firm's assets and on the firm's debt ($\rho_{V,D}$),

a correlation of rates of return on the firm's assets and on the firm's equity ($\rho_{V,E}$),

a covariance of rates of return on the firm's debt and on the firm's equity, per annum ($\sigma_{D,E}$),

a covariance of rates of return on the firm's assets and on the firm's debt, per annum ($\sigma_{V,D}$),

a covariance of rates of return on the firm's assets and on the firm's equity, per annum ($\sigma_{V,E}$),

calculating values for the parameter or parameters so selected using one or more of the following formula:

$$\sigma_B = \sqrt{\ln\left(\frac{V_T^2[1-N(d_3)]e^{\sigma_V^2 T} + X^2 N(d_2)}{B_T^2}\right)\Big/T}$$

$$\sigma_S = \sqrt{\ln\left(\frac{V_T^2 N(d_3)e^{\sigma_V^2 T} - 2V_T XN(d_1) + X^2 N(d_2)}{S_T^2}\right)\Big/T}$$

$$\rho_{BS} = \frac{X - B_T}{B_T\sqrt{\left(e^{\sigma_S^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VB} = \frac{V_T[1-N(d_3)]e^{\sigma_V^2 T} + XN(d_1) - B_T}{B_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VS} = \frac{V_T N(d_3)e^{\sigma_V^2 T} - XN(d_1) - S_T}{S_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_S^2 T}-1\right)}}$$

$$\sigma_{BS} = \rho_{BS}\sigma_B\sigma_S$$

$$\sigma_{VB} = \rho_{VB}\sigma_V\sigma_B$$

$$\sigma_{VS} = \rho_{VS}\sigma_V\sigma_S$$

where<u>in</u> ~~the additional term is~~:

<u>S_n is a value of the equity of the firm at time *n*,</u>

<u>V_n is a value of the firm's assets at time *n*,</u>

<u>B_n is a value of the debt of the firm at time *n*,</u>

<u>*X* is a face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity,</u>

<u>*T* is a user selected time horizon, in years,</u>

<u>r_V is a rate of return on the firm's assets, per annum,</u>

σ_V is a standard deviation of rates of return on the firm's assets, per annum,

σ_E is a standard deviation of rates of return on the firm's equity, per annum,

σ_D is a standard deviation of rates of return on the firm's debt, per annum,

values for d_1, d_2 and d_3 are calculated using the formula:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] / \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T},$$

$$d_3 = d_1 + \sigma_V \sqrt{T},$$

$N()$ is the cumulative probability of the standard normal distribution with d_1, d_2 or d_3 as the upper limit;

prior to calculating values of the selected parameter or parameters, receiving such of the following that are necessary to undertake the said calculations using the said formula:

a value of the equity of the firm at time *n*,

a value of the firm's assets at time *n*,

a value of the debt of the firm at time *n*,

a face value of the firm's debt,

a user selected time horizon, in years,

a rate of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's equity, per annum,

a standard deviation of rates of return on the firm's debt, per annum; and

using one or more of the values of the selected parameters so calculated to fit the option-theoretic model of the firm.

219. (Currently Amended) A system for relating a price or value of a plurality of securities associated with an underlying asset, [[the]] a rate of return on said securities and [[the]] risk attributes of said securities, the system comprising:

at least one processor;

at least one computer-readable memory communicatively coupled to the at least one processor when the system is operational, the memory bearing processor-executable instructions that, when executed on at least one processor, cause the at least one processor to perform operations comprising:[[;]]

~~a risk analysis unit operative to designate~~ designating that a priced risk factor incorporated in the risk premium for each security is [[the]] volatility, measured over discrete time, of returns[[,]] ~~measured over discrete time~~;

~~a risk pricing unit operative to:~~

~~determine~~ determining a risk premium incorporated in the rate of return for each security; [[and]]

~~designate~~ designating that [[the]] a price per unit of this risk factor is the same for two or more of the said securities;

~~a financial modelling unit operative to define~~ defining a financial model ~~comprising data~~ representing at least one relationship[[s]] between the risk premiums determined for each security;

~~and store~~ storing the model in the computer-readable memory; and

~~a user interface device operative to exchange~~ exchanging information with a user via a user interface.

220. (Currently Amended) The computer system of claim 219, wherein at least one of said plurality of securities is a debt-type instrument, and the at least one memory further bears

processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising: ~~risk pricing unit is further operative to analyse~~

analyzing a yield spread associated with the debt-type instrument and identify a default loss component and a risk premium component of said yield spread.

221. (Currently Amended) The computer system of claim 219, wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising: ~~financial modelling unit is further operative to~~

fitting the model.

222. (Currently Amended) The computer system of claim 221, wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising: ~~user interface device is further operative to provide~~ providing as output to a user, via the user interface, parameters of the fitted model.

223. (Currently Amended) The computer system of claim 219, wherein an estimate of [[the]] an expected default loss of another~~, debt-type~~ security that is of a debt-type (security *j*) issued by, or referenced to, the firm, is utilised in analysing [[the]] a rate of return for a security (or securities) issued by, or referenced to, a firm, and wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:[[;]]

~~the financial modelling unit is further operative to determine the~~ determining a rate of return on security *j* (r_j) by reference to [[the]] a promised yield on said security (y_j) and the expected default loss (EDL_j) on said security where $r_j = y_j - EDL_j$;

~~the risk pricing unit is further operative to calculate the~~ calculating an excess return for said security *j* as equal to $r_j - r$, where *r* is [[the]] a risk free rate of return;

~~the risk analysis unit is further operative to calculate the~~ calculating an exposure of each security to each priced risk factor (*m*);

~~the risk pricing unit is further operative to calculate~~ calculating a price per unit of risk (λ_m) for each priced risk factor (*m*) in which each λ_m is the same for two or more securities issued by, or referenced to, the firm and such that the sum of the products of the risk exposures for security *j* and the prices per unit of risk equals the excess return for security *j*, and similarly for any other security for which an estimate of the excess return is available;

~~the risk analysis unit is further operative to designate~~ designating that one of the priced risk factors relates to a [[the]] volatility, estimated over a discrete time period, of the rate of return on securities and is specific to securities issued by, or referenced to, the firm;

~~the risk pricing unit is further operative to calculate~~ calculating an [[the]] excess rate of return for all [[of the]] other securities being analysed, other than *j*, based at least partly on their exposure to each priced risk factor and the price per unit of risk for each risk factor;

~~the financial modelling unit is further operative to~~ fitting the model; and

~~the user interface is further operative to provide~~ providing as output to a user parameters of interest to the user from the fitted model.

224. (Currently Amended) The computer system of claim 223, wherein the only risk factor priced in the said system comprises the volatility of returns, and wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:[[;]]

~~the risk pricing unit is further operative to designate~~ designating the relationship between [[the]] a firm specific price of volatility risk (λ_σ), the rate of return for *j* (r_j), the volatility of returns for *j* (σ_j) and the risk free rate of return (*r)* as:

$$\lambda_\sigma = \frac{r_j - r}{\sigma_j};$$

~~the risk pricing unit is further operative to designate the~~ designating a rate of return (r_k) on another class, or classes, of security (k) issued by, or referenced to, the firm as:

$$r_k = r + \lambda_\sigma \sigma_k ;$$

~~the risk analysis unit is further operative to designate~~ designating, where security class or classes k are debt-type securities, [[the]] a default loss on said securities by combining the promised yield on said securities (y_k) and their rate of return (r_k) as follows:

$$EDL_k = y_k - r_k ;$$

~~the financial modelling unit is further operative to~~ fitting the model; and

~~the user interface is further operative to provide~~ providing as output to a user parameters of interest to the user from the fitted model.

225. (Withdrawn) A system for measuring credit risk, the system comprising:

a computer-readable memory; and

a processing unit operative to estimate the covariance of returns for two assets, wherein said covariance is used as a measure of credit risk of one of the assets.

226. (Withdrawn) The computer system of claim 225, wherein the processing unit is further operative to analyse, as the said two assets, two securities issued by, or referenced to, the same firm, wherein said covariance output is used as a measure of credit risk of the security that ranks highest in priority upon a liquidation or default event.

227. (Withdrawn) A system for estimating the covariance of securities, the system comprising:

a computer-readable memory;

a processing unit operative to estimate the expected default loss of a security, wherein said estimate of expected default loss is used as a measure of the covariance of returns for that security and another security issued by, or referenced to, the same firm wherein the first security ranks higher in priority upon a liquidation or default event.

228. (Withdrawn) The computer system of claim 226, wherein:

the financial modelling unit is further operative to designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \ln\left(\rho_{jk} \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)} + 1 \right) \Big/ T$$

where:

j is the class or classes of the firm's debt-type or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

ρ_{jk} is the correlation coefficient of the rates of return for j and k;

the financial modelling unit is further operative to fit the model; and

the user interface device is further operative to output parameters of interest from the fitted model to a user.

229. (Withdrawn) The computer system of claim 227, wherein:

the financial modelling unit is further operative to

designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \ln\left(\rho_{jk} \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)} + 1 \right) \Big/ T$$

where:

j is the class or classes of the firm's debt-type or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

ρ_{jk} is the correlation coefficient of the rates of return for j and k;

the financial modelling unit is further operative to fit the model; and

the user interface device is further operative to output parameters of interest from the fitted model to a user.

230. (Withdrawn) The computer system of claim 225, wherein the financial modelling unit is further operative to designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

the financial modelling unit is further operative to fit the model; and

the user interface device is further operative to output parameters of interest from the fitted model to a user.

231. (Withdrawn) The computer system of claim 226, wherein the financial modelling unit is further operative to designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

the financial modelling unit is further operative to fit the model; and

the user interface device is further operative to output parameters of interest from the fitted model to a user.

232. (Withdrawn) The computer system of claim 227, wherein the financial modelling unit is further operative to designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

the financial modelling unit is further operative to fit the model; and

the user interface device is further operative to output parameters of interest from the fitted model to a user.

233. (Withdrawn) The computer system of claim 227, wherein the processing unit is further operative to analyse, as the two assets, portfolios or indices in respect of different types of security, wherein said covariance is used as a measure of credit risk.

234. (Withdrawn) A system for estimating the correlation of securities, the system comprising:

a computer-readable memory;

a processing unit operative to estimate the correlation of returns for two securities issued by, or referenced to, a firm by relating the said correlation to computer generated estimates of the variance of the said securities and the expected default loss of one of the said securities.

235. (Withdrawn) The computer system of claim 234, wherein the processing unit is further operative to:

designate the correlation (ρ_{jk}) of the returns for the two said securities, j and k, as:

$$\rho_{jk} = EDL_j T \Big/ \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)}$$

where:

j is the class or classes of the firm's debt or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

EDL_j the annualised expected default loss on security j;

fit the model; and

output parameters of interest from the fitted model to a user.

236. (Withdrawn) The computer system of claim 234, wherein the processing unit is further operative to:

designate the correlation (ρ_{jk}) of the returns for two said securities j and k, as:

$$\rho_{jk} = EDL_j / \sigma_j \sigma_k \ ;$$

fit the model; and

output parameters of interest from the fitted model to the user.

237. (Currently Amended) The computer system of claim 219, wherein one or more of the securities being analysed by the said system is an option, and wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:[[;]]

~~the financial modelling unit is further operative to specify the~~ specifying a real world distribution process that [[the]] returns on the underlying asset are expected to follow;

receiving data on features of the option;

receiving adjustments for any factors specified by a user;

~~the financial modelling unit is further operative to calculate the~~ calculating an expected real world probability of the option being exercised based on the real world distribution process and the option's features;

~~the risk pricing unit is further operative to calculate the~~ calculating an expected mean of the option, at the time the option is expected to be exercised;

~~the risk analysis unit is further operative to calculate~~ calculating the standard deviation and other higher moments of interest of the option, at the time the option is expected to be exercised;

~~the financial modelling unit is further operative to use~~ using the expected mean value of the option, at the time the option is expected to be exercised, and the option's features ~~aforesaid parameters~~ to calculate [[the]] an expected real world pay off from the option;

~~the risk pricing unit is further operative to~~ discounting back to present value (as at the chosen evaluation date) the pay off from the option using a risk adjusted discount rate, where said risk adjusted discount rate includes a risk premium for the expected standard deviation (measured over discrete time) of the expected option pay off, for such other higher moments of interest to the user and adjustments for any other factors specified by a user, such that the price per unit of risk, for each risk factor, is equated for two or more assets or securities selected from the options being evaluated, the underlying asset and any other securities of interest referenced thereto; and

~~the user interface is further operative to provide~~ providing as output to a user parameters of interest to the user from the fitted model.

238. (Currently Amended) The computer system of claim 237, wherein the ~~financial modelling, risk analysis and risk pricing units are further operative to use~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

using the estimated values for the rate of return, standard deviation, other higher moments of interest and any other factors specified by a user for the asset, derived as output from said claims, as input to price or value other options contingent on the same or similar assets.

239. (Currently Amended) The computer system of claim 219, wherein the user applies an option-theoretic model of the firm, and wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:[[;]]

~~the financial modelling unit is further operative to determine~~ determining a plurality of input parameters, the parameters including a risk premium in the rate of return for each security issued by, or referenced to, the firm;

~~the financial modelling unit is further operative to define~~ defining relationships between said parameters;

~~the financial modelling unit is further operative to~~ fitting the model; and

~~the user interface is further operative to provide~~ providing as output to a user parameters of interest to the user from the fitted model.

240. (Currently Amended) The computer system of claim 239, wherein the at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising::

~~the financial modelling unit is further operative to specify the real world distribution process that the returns on the firms assets are expected to follow~~ receiving data on features of the securities issued by, or referenced to, the firm;

~~specify a default point representing the value of the firm's assets at which the firm is expected to default~~ receiving adjustments for any factors specified by a user;

specifying [[the]] a real world distribution process that the returns on the firm's assets are expected to follow;

~~the financial modelling unit is further operative to~~ specifying a default point representing the value of the firm's assets at which the firm is expected to default;

~~the financial modelling unit is further operative to calculate~~ calculating [[the]] an expected real world probability of the default point being met;

~~the risk pricing unit is further operative to calculate~~ calculating [the]] an expected mean of the securities being analysed, having regard to the distribution process modelled for the firm's assets and the default point, at [[the]] a time horizon of interest;

~~the risk analysis unit is further operative to calculate~~ calculating the standard deviation and other higher moments of interest of the securities being analysed, having regard to the distribution process modelled for the firm's assets and the default point, at the time horizon of interest;

~~the financial modelling unit is further operative to use~~ using the expected mean value of the securities, at the time horizon of interest, and the securities' features ~~aforesaid parameters~~ to calculate an [[the]] expected real world pay off of the securities being analysed, at the time horizon of interest;

~~the risk pricing unit is further operative to~~ discounting back to present value (as at [[the]] a chosen evaluation date) the expected pay offs of each security being analysed using a risk adjusted discount rate, where said risk adjusted discount rate includes a risk premium for the expected standard deviation of the expected pay off from the security, for such other higher moments of interest to the user and adjustments for any other factors specified by a user, such that [[the]] a price per unit of risk, for each such risk factor, is equated for two or more securities issued by, or referenced to, the firm;

~~the financial modelling unit is further operative to~~ fitting the model; and

~~the user interface is further operative to provide~~ providing as output to a user parameters of interest to the user from the fitted model.

241. (Currently Amended) The computer system of claim 239 ~~237~~, wherein the ~~financial modelling unit is further operative to~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

~~define~~ defining additional multi-variate equations representing relationships between variables, which comprise some or all of the inputs to and/or outputs ~~some or all of the variables used in the financial modelling unit~~ in the said claim; and

[[solve]] solving all of the multi-variate equations and the model used in the said claim, to calculate revised values for the ~~remaining unknown~~ variables in the multi-variate equations and the model.

242. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations a statistical moment of one of the securities issued by, or referenced to the firm.

243. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] a correlation between the returns of a pair of securities issued by, or referenced to, the firm.

244. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] a covariance between the returns of a pair of securities issued by, or referenced to, the firm.

245. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multivariate equations [[the]] a correlation between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

246. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multivariate equations [[the]] a covariance between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

247. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multivariate equations [[the]] an expected probability of default.

248. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] an expected loss given default on a debt-type security issued by, or referenced to, the firm.

249. (Currently Amended) The computer system of claim 241, wherein the ~~financial modelling unit is further operative to include~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

including as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] an expected default loss on a debt-type security issued by, or referenced to, the firm.

250. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is a statistical moment of the returns of one of the securities issued by, or referenced to, the firm.

251. (Currently Amended) The computer system of 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a correlation between the returns of a pair of securities issued by, or referenced to, the firm.

252. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a covariance between the returns of a pair of securities issued by, or referenced to, the firm.

253. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a correlation between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

254. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a covariance between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

255. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected probability of default.

256. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected loss given default on a debt-type security issued by, or referenced to, the firm.

257. (Currently Amended) The computer system of claim 239, wherein the ~~financial modelling unit is further operative to generate~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

generating one or more parameters from the model and ~~solve~~ solving the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected default loss on a debt-type security issued by, or referenced to, the firm.

258. (Currently Amended) The computer system of claim 237, wherein the ~~financial modelling unit is further operative to model~~ at least one memory further bears processor-

executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

modelling the real world distribution process that the returns on the firm (or underlying asset) are expected to follow as a specified statistical distribution, wherein the mean, standard deviation and other higher moments of interest of [[the]] portions of that distribution relevant to a security are estimated using closed-form type formula solutions or numerical approximations appropriate for the specified statistical distribution process.

259. (Currently Amended) The computer system of claim 240, wherein the ~~financial modelling unit is further operative to model~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

modelling the real world distribution process that the returns on the firm (or underlying asset) are expected to follow as a specified statistical distribution, wherein the mean, standard deviation and other higher moments of interest of [[the]] portions of that distribution relevant to a security are estimated using closed-form type formula solutions or numerical approximations appropriate for the specified statistical distribution process.

260. (Currently Amended) The computer system of claim 258, wherein the ~~financial modelling unit is further operative to model~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

modelling the real world ~~statistical~~ distribution process that the returns on the firm (or underlying asset) are expected to follow as the normal distribution.

261. (Currently Amended) The computer system of claim 259, wherein the ~~financial modelling unit is further operative to model~~ at least one memory further bears processor-

executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

modelling the real world ~~statistical~~ distribution process that the returns on the firm (or underlying asset) are expected to follow as the normal distribution.

262. (Currently Amended) The computer system of claim 261, wherein the firm has, or is treated as having, only a single class of zero coupon debt on issue and the ~~financial modelling unit is further operative to fit the model such that~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a promised yield on the firm's debt, per annum (y),

a risk free rate of return, per annum (r),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

a standard deviation of rates of return on the firm's debt, per annum (σ_B),

a standard deviation of rates of return on the firm's equity, per annum (σ_S);

calculating values for d_1 and d_2, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T} \right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T} \ ;$$

calculating values for:

$$\frac{\ln\left(\dfrac{V_0 e^{r_V T}\left[1 - N(d_1)\right] + B_0 e^{yT} N(d_2)}{B_0} \right) \Big/ T - r}{\sigma_B}, \text{and}$$

$$\frac{\ln\left(\dfrac{V_0 e^{r_V T} N(d_1) - B_0 e^{yT} N(d_2)}{S_0} \right) \Big/ T - r}{\sigma_S}$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 or d_2 as the upper limit; and

fitting the model such that:

$$\frac{\ln\left(\dfrac{V_0 e^{r_V T}\left[1 - N(d_1)\right] + B_0 e^{yT} N(d_2)}{B_0} \right) \Big/ T - r}{\sigma_B} = \frac{\ln\left(\dfrac{V_0 e^{r_V T} N(d_1) - B_0 e^{yT} N(d_2)}{S_0} \right) \Big/ T - r}{\sigma_S}$$

~~where:~~

- ~~S_n is the value of the equity of the firm at time *n*~~
- ~~V_n is the value of the firm's assets at time *n* and the value of the firm's assets is the sum of the values of the firm's debt (*B*) and equity (*S*)~~
- ~~*X* is the face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity~~
- ~~*T* is the user selected time horizon, in years~~

~~r_V is the rate of return on the firm's assets, per annum~~

~~y is the promised yield on the firm's debt, per annum~~

~~$d_1 = \left(\left[\ln\left(V_0 / X\right) + r_V T \right] / \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right)$~~

~~$d_2 = d_1 - \sigma_V \sqrt{T}$~~

~~$N(.)$ is the cumulative probability of the standard normal distribution with d_1 or d_2 as the upper limit~~

~~r is the risk-free rate of return, per annum~~

~~σ_V is the standard deviation of rates of return on the firm's assets, per annum~~

~~σ_B is the standard deviation of rates of return on the firm's debt, per annum~~

~~σ_S is the standard deviation of rates of return on the firm's equity, per annum.~~

263. (Currently Amended) A system for applying an option-theoretic model of a firm, the system comprising:

at least one processor;

at least one computer-readable memory communicatively coupled to the at least one processor when the system is operational, the memory bearing processor-executable instructions that, when executed on a processor, cause the processor to perform operations comprising:[[;]]

~~a processing unit operative to~~ estimating ~~generate~~ one or more risk parameters estimated over a discrete time period from [[the]] said option-theoretic model;[[,]]

defining an option-theoretic model of a firm, receiving values for risk parameters specified by a user, receiving a plurality of input parameters, processing said input parameters ~~estimated over a discrete time period~~, and solv[[e]]ing the model so that the ~~said~~ estimated risk parameters equal the values specified by ~~a~~ the user; and

exchanging information with a user via a user interface.

264. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

using as one of the said risk parameters a statistical moment of [[the]] returns of one or more ~~of the~~ securities issued by, or referenced to, the firm.

265. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

using as one of the said risk parameters [[the]] a correlation between [[the]] returns of a pair of securities issued by, or referenced to, the firm.

266. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use~~ memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

using as one of the said risk parameters [[the]] a covariance between [[the]] returns of a pair of securities issued by, or referenced to, the firm.

267. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

using as one of the said risk parameters [[the]] a correlation between [[the]] returns of a security issued by, or referenced to, the firm and [[the]] returns of the total firm.

268. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

using as one of the said risk parameters [[the]] a covariance between [[the]] returns of a security issued by, or referenced to, the firm and [[the]] returns of the total firm.

269. (Currently Amended) The computer system of claim 239, wherein the ~~processing unit is further operative to use formula for calculating additional parameters, being instantaneous volatility, for calibration with the model, said formula comprising~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a promised yield on the firm's debt, per annum (r_S),

a risk free rate of return, per annum (r_B),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

calculating a value for d_1, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] / \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T} \right),$$

calculating a value for an instantaneous standard deviation of rates of return on the firm's debt, per annum (σ_B), using the formula:

$$\sigma_B = \sigma_V \frac{V_0}{B_0} e^{(r_V - r_B)T} \left[1 - N(d_1) \right];$$ and/or

calculating a value for an instantaneous standard deviation of rates of return on the firm's equity, per annum (σ_S), using the formula:

$$\sigma_S = \sigma_V \frac{V_0}{S_0} e^{(r_V - r_S)T} N(d_1)$$;

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 as the upper limit; and

using one or both said values of instantaneous standard deviation to fit the option-theoretic model of the firm.

270. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use formula for calculating additional parameters, being instantaneous volatility, for calibration with the model, said formula comprising~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a rate of return on the firm's equity, per annum (r_S),

a rate of return on the firm's debt, per annum (r_B),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

calculating a value for d_1, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T} \right),$$

calculating a value for an instantaneous standard deviation of rates of return on the firm's debt, per annum (σ_B), using the formula:

$$\sigma_B = \sigma_V \frac{V_0}{B_0} e^{(r_V - r_B)T} \left[1 - N(d_1) \right]$$

;and/or

calculating a value for an instantaneous standard deviation of rates of return on the firm's equity, per annum (σ_S), using the formula:

$$\sigma_S = \sigma_V \frac{V_0}{S_0} e^{(r_V - r_S)T} N(d_1) ;$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 as the upper limit; and

using one or both said values of instantaneous standard deviation to fit the option-theoretic model of the firm.

271. (Currently Amended) The computer system of claim 239, wherein the ~~processing unit is further operative to use formula for calculating additional parameters, being instantaneous volatility, for calibration with the model, said formula comprising~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

receiving user selection of one or more of the following parameters, to be calculated over discrete time, for calibration with the model:

a standard deviation of rates of return on the firm's debt, per annum (σ_B),

a standard deviation of rates of return on the firm's equity, per annum (σ_S),

a correlation of rates of return on the firm's debt and on the firm's equity (ρ_{BS}),

a correlation of rates of return on the firm's assets and on the firm's debt (ρ_{VB}),

a correlation of rates of return on the firm's assets and on the firm's equity (ρ_{VS}),

a covariance of rates of return on the firm's debt and on the firm's equity, per annum (σ_{BS}),

a covariance of rates of return on the firm's assets and on the firm's debt, per annum (σ_{VB}),

a covariance of rates of return on the firm's assets and on the firm's equity, per annum (σ_{VS}),

calculating values for the parameter or parameters so selected using one or more of the following formula:

$$\sigma_B = \sqrt{\ln\left(\frac{V_T^2[1-N(d_3)]e^{\sigma_V^2 T} + X^2 N(d_2)}{B_T^2}\right)\Big/T}$$

$$\sigma_S = \sqrt{\ln\left(\frac{V_T^2 N(d_3)e^{\sigma_V^2 T} - 2V_T XN(d_1) + X^2 N(d_2)}{S_T^2}\right)\Big/T}$$

$$\rho_{BS} = \frac{X - B_T}{B_T\sqrt{\left(e^{\sigma_S^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VB} = \frac{V_T[1-N(d_3)]e^{\sigma_V^2 T} + XN(d_1) - B_T}{B_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VS} = \frac{V_T N(d_3)e^{\sigma_V^2 T} - XN(d_1) - S_T}{S_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_S^2 T}-1\right)}}$$

$$\sigma_{BS} = \rho_{BS}\sigma_B\sigma_S$$

$$\sigma_{VB} = \rho_{VB}\sigma_V\sigma_B$$

$$\sigma_{VS} = \rho_{VS}\sigma_V\sigma_S$$

wherein ~~the additional term is~~:

S_n is a value of the equity of the firm at time *n*,

V_n is a value of the firm's assets at time *n*,

B_n is a value of the debt of the firm at time *n*,

X is a face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity,

T is a user selected time horizon, in years,

r_V is a rate of return on the firm's assets, per annum,

σ_V is a standard deviation of rates of return on the firm's assets, per annum,

σ_S is a standard deviation of rates of return on the firm's equity, per annum,

σ_B is a standard deviation of rates of return on the firm's debt, per annum,

values for d_1, d_2 and d_3 are calculated using the formula:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T},$$

$$d_3 = d_1 + \sigma_V \sqrt{T}.$$

N() is the cumulative probability of the standard normal distribution with d_1, d_2 or d_3 as the upper limit;

prior to calculating values of the selected parameter or parameters, receiving such of the following that are necessary to undertake the said calculations using the said formula:

a value of the equity of the firm at time *n*,

a value of the firm's assets at time *n*,

a value of the debt of the firm at time *n*,

a face value of the firm's debt,

a user selected time horizon, in years,

a rate of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's equity, per annum,

a standard deviation of rates of return on the firm's debt, per annum; and

using one or more of the values of the selected parameters so calculated to fit the option-theoretic model of the firm.

272. (Currently Amended) The computer system of claim 263, wherein the ~~processing unit is further operative to use formula for calculating additional parameters, being instantaneous volatility, for calibration with the model, said formula comprising~~ at least one memory further bears processor-executable instructions that, when executed on the at least one processor, cause the at least one processor to perform operations comprising:

receiving user selection of one or more of the following parameters, to be calculated over discrete time, for calibration with the model:

a standard deviation of rates of return on the firm's debt, per annum (σ_D),

a standard deviation of rates of return on the firm's equity, per annum (σ_E),

a correlation of rates of return on the firm's debt and on the firm's equity (ρ_{DE}),

a correlation of rates of return on the firm's assets and on the firm's debt (ρ_{VD}),

a correlation of rates of return on the firm's assets and on the firm's equity (ρ_{VE}),

a covariance of rates of return on the firm's debt and on the firm's equity, per annum (σ_{DE}),

a covariance of rates of return on the firm's assets and on the firm's debt, per annum (σ_{VD}),

a covariance of rates of return on the firm's assets and on the firm's equity, per annum (σ_{VE}),

calculating values for the parameter or parameters so selected using one or more of the following formula:

$$\sigma_B = \sqrt{\ln\left(\frac{V_T^2[1-N(d_3)]e^{\sigma_V^2 T} + X^2 N(d_2)}{B_T^2}\right)\Big/T}$$

$$\sigma_S = \sqrt{\ln\left(\frac{V_T^2 N(d_3)e^{\sigma_V^2 T} - 2V_T XN(d_1) + X^2 N(d_2)}{S_T^2}\right)\Big/T}$$

$$\rho_{BS} = \frac{X - B_T}{B_T\sqrt{\left(e^{\sigma_S^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VB} = \frac{V_T[1-N(d_3)]e^{\sigma_V^2 T} + XN(d_1) - B_T}{B_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VS} = \frac{V_T N(d_3)e^{\sigma_V^2 T} - XN(d_1) - S_T}{S_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_S^2 T}-1\right)}}$$

$$\sigma_{BS} = \rho_{BS}\sigma_B\sigma_S$$

$$\sigma_{VB} = \rho_{VB}\sigma_V\sigma_B$$

$$\sigma_{VS} = \rho_{VS}\sigma_V\sigma_S$$

wherein ~~the additional term is~~:

S_n is a value of the equity of the firm at time *n*,

V_n is a value of the firm's assets at time *n*,

B_n is a value of the debt of the firm at time *n*,

X is a face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity,

T is a user selected time horizon, in years,

r_V is a rate of return on the firm's assets, per annum,

σ_V is a standard deviation of rates of return on the firm's assets, per annum,

σ_E is a standard deviation of rates of return on the firm's equity, per annum,

σ_D is a standard deviation of rates of return on the firm's debt, per annum,

values for d_1, d_2 and d_3 are calculated using the formula:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] / \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T},$$

$$d_3 = d_1 + \sigma_V \sqrt{T}.$$

N() is the cumulative probability of the standard normal distribution with d_1, d_2 or d_3 as the upper limit;

prior to calculating values of the selected parameter or parameters, receiving such of the following that are necessary to undertake the said calculations using the said formula:

a value of the equity of the firm at time *n*,

a value of the firm's assets at time *n*,

a value of the debt of the firm at time *n*,

a face value of the firm's debt,

a user selected time horizon, in years,

a rate of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's equity, per annum,

a standard deviation of rates of return on the firm's debt, per annum; and

using one or more of the values of the selected parameters so calculated to fit the option-theoretic model of the firm.

273. (Currently Amended) A non-transitory computer-readable medium ~~having computer-executable instructions~~ for ~~performing a method~~ relating a price or value of a plurality of securities associated with an underlying asset, [[the]] a rate of return on said securities and [[the]] risk attributes of said securities, ~~the method~~ bearing computer-executable instructions that, upon execution by a computer, cause the computer to perform operations comprising:

determining a risk premium incorporated in the rate of return for each security;

designating that a priced risk factor incorporated in the risk premium for each security is [[the]] volatility, measured over discrete time, ~~of returns, measured over discrete time,~~ and that [[the]] a price per unit of this risk factor is the same for two or more of the said securities; and

defining a computer-implemented financial model ~~comprising data~~ representing the relationships between the risk premiums determined for each security.

274. (Currently Amended) The non-transitory computer-readable medium of claim 273, wherein at least one of said plurality of securities is a debt-type instrument, and ~~further comprising computer-executable instructions for~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

analysing a yield spread associated with the debt-type instrument and identifying a default loss component and a risk premium component of said yield spread.

275. (Currently Amended) The non-transitory computer-readable medium of claim 273, further ~~comprising computer-executable instructions to fit the model.~~ bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

fitting the model.

276. (Currently Amended) The non-transitory computer-readable medium of claim 275, ~~further comprising computer-executable instructions to~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

outputting to a user parameters of the fitted model.

277. (Currently Amended) The non-transitory computer-readable medium of claim 273, further comprising computer-executable instructions for utilising an estimate of [[the]] an expected default loss of another~~, debt-type~~ security that is of a debt-type (security *j*) issued by, or referenced to, the firm, in analysing [[the]] a rate of return for a security (or securities) issued by, or referenced to, a firm, said ~~analysis comprising:~~ computer-executable instructions, upon execution by the computer, causing the computer to perform operations comprising:

determining [[the]] a rate of return on security *j* (r_j) by reference to [[the]] a promised yield on said security (y_j) and the expected default loss (EDL_j) on said security where:

$$r_j = y_j - EDL_j$$

calculating [[the]] an excess return for said security *j* as equal to $r_j - r$, where *r* is [[the]] a risk free rate of return;

calculating [[the]] an exposure of each security to each priced risk factor (*m*);

calculating a price per unit of risk (λ_m) for each priced risk factor (*m*) in which each λ_m is the same for two or more securities issued by, or referenced to, the firm and such that the sum of the products of the risk exposures for security *j* and the prices per unit of risk equals the excess return for security *j*, and similarly for any other security for which an estimate of the excess return is available;

designating that one of the priced risk factors relates to [[the]] a volatility, estimated over a discrete time period, of the rate of return on securities ~~estimated over a discrete time period~~ and is specific to securities issued by, or referenced to, the firm;

calculating [[the]] an excess rate of return for all of the other securities being analysed, other than *j*, based at least partly on their exposure to each priced risk factor and the price per unit of risk for each risk factor;

fitting the model; and

providing as output to a user parameters of interest to the user from the fitted model.

278. (Currently Amended) The non-transitory computer-readable medium of claim 277, wherein the only risk factor priced in accordance with the computer-executable instructions is the volatility of returns and the said computer-executable instructions, upon execution by the computer, cause the computer to perform operations comprising:

designat[[e]]ing the relationship between [[the]] a firm specific price of volatility risk (λ_σ), the rate of return for *j* (r_j), the volatility of returns for *j* (σ_j) and the risk free rate of return (*r)* as:

$$\lambda_\sigma = \frac{r_j - r}{\sigma_j}$$

designat[[e]]ing a [[the]] rate of return (r_k) on another class, or classes, of security (k) issued by, or referenced to, the firm as:

$$r_k = r + \lambda_\sigma \sigma_k$$

designat[[e]]ing, where security class or classes *k* are debt-type securities, [[the]] a default loss on said securities by combining the promised yield on said securities (y_k) and their rate of return (r_k) as follows:

$$EDL_k = y_k - r_k$$

fitting the model; and

provid[[e]]ing as output to a user parameters of interest to the user from the fitted model.

279. (Withdrawn) A computer readable medium having computer-executable instructions for estimating the covariance of returns for two assets, wherein said covariance is used as a measure of credit risk of one of the assets.

280. (Withdrawn) The computer-readable medium of claim 279, wherein the two assets analysed in accordance with the computer-executable instructions are securities issued by, or referenced to, the same firm, and said covariance output is used as a measure of credit risk of the security that ranks highest in priority upon a liquidation or default event.

281. (Withdrawn) A computer-readable medium having computer-executable instructions for estimating the expected default loss of a security, wherein said estimate of expected default loss is used as a measure of the covariance of returns for that security and another security issued by, or referenced to, the same firm wherein the first security ranks higher in priority upon a liquidation or default event.

282. (Withdrawn) The computer-readable medium of claim 280, wherein the computer-executable instructions:

designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \ln\left(\rho_{jk}\sqrt{\left(e^{\sigma_j^2 T}-1\right)\left(e^{\sigma_k^2 T}-1\right)}+1\right)\Big/T$$

where:

j is the class or classes of the firm's debt-type or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

ρ_{jk} is the correlation coefficient of the rates of return for j and k;

fit the model; and

output parameters of interest from the fitted model to a user.

283. (Withdrawn) The computer-readable medium of claim 281, wherein the computer-executable instructions:

designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \ln\left(\rho_{jk}\sqrt{\left(e^{\sigma_j^2 T}-1\right)\left(e^{\sigma_k^2 T}-1\right)}+1\right)\Big/T$$

where:

j is the class or classes of the firm's debt-type or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

ρ_{jk} is the correlation coefficient of the rates of return for j and k;

fit the model; and

output parameters of interest from the fitted model to a user.

284. (Withdrawn) The computer-readable medium of claim 279, wherein the computer-executable instructions:

designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

fit the model; and

provide as output to a user parameters of interest from the fitted model.

285. (Withdrawn) The computer-readable medium of claim 280, wherein the computer-executable instructions:

designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

fit the model; and

provide as output to a user parameters of interest from the fitted model.

286. (Withdrawn) The computer-readable medium of claim 281, wherein the computer-executable instructions:

designate the annualised expected default loss (EDL_j) on one of the said securities, security j, as:

$$EDL_j = \rho_{jk}\sigma_j\sigma_k$$

fit the model; and

provide as output to a user parameters of interest from the fitted model.

287. (Withdrawn) The computer-readable medium of claim 279, wherein the two assets analysed with the computer-executable instructions are portfolios or indices in respect of different types of security and said covariance output is used as a measure of credit risk.

288. (Withdrawn) A computer-readable medium having computer-executable instructions for estimating the correlation of returns for two securities issued by, or referenced to, a firm by relating the said correlation to computer generated estimates of the variance of the said securities and the expected default loss of one of the said securities.

289. (Withdrawn) The computer-readable medium of claim 288, wherein the computer-executable instructions:

designate the correlation (ρ_{jk}) of the returns for the two said securities, j and k, as:

$$\rho_{jk} = EDL_j T \Big/ \sqrt{\left(e^{\sigma_j^2 T} - 1\right)\left(e^{\sigma_k^2 T} - 1\right)}$$

where:

j is the class or classes of the firm's debt or similar securities issued by, or referenced to, the firm for which the expected default loss is being estimated

k is the class or classes of security issued by, or referenced to, the firm that rank behind security j in terms of priority upon a liquidation or default event

T is the time horizon of interest to the user, in years

σ_j is the standard deviation of rates of return, per annum, of j

σ_k is the standard deviation of rates of return, per annum, of k

EDL_j the annualised expected default loss on security j;

fit the model; and

output parameters of interest from the fitted model to a user.

290. (Withdrawn) The computer-readable medium of claim 288, wherein the computer-executable instructions:

designate the correlation (ρ_{jk}) of the returns for two said securities j and k, as:

$$\rho_{jk} = EDL_j / \sigma_j \sigma_k \ ;$$

fit the model; and

output parameters of interest from the fitted model to the user.

291. (Currently Amended) The non-transitory computer-readable medium of claim 273, wherein one or more of the securities being analysed with the computer-executable instructions

is an option, and ~~the said computer-executable instructions~~ further bearing computer executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

specifying [[the]] a real world distribution process that [[the]] returns on the underlying asset are expected to follow;

receiving data on features of the option;

receiving adjustments for any factors specified by a user;

calculat[[e]]ing [[the]] an expected real world probability of the option being exercised based on the real world distribution process and the option's features;

calculat[[e]]ing [[the]] an expected mean, standard deviation and other higher moments of interest of the option, at the time the option is expected to be exercised;

us[[e]]ing the expected mean value of the option, at the time the option is expected to be exercised, and the option's features ~~aforesaid parameters~~ to calculate [[the]] an expected real world pay off from the option;

discounting back to present value (as at the chosen evaluation date) the pay off from the option using a risk adjusted discount rate, where said risk adjusted discount rate includes a risk premium for the expected standard deviation (measured over discrete time) of the expected option pay off, for such other higher moments of interest to the user and adjustments for any other factors specified by a user, such that the price per unit of risk, for each risk factor, is equated for two or more assets or securities selected from the options being evaluated, the underlying asset and any other securities of interest referenced thereto; and

provid[[e]]ing as output to a user parameters of interest to the user from the fitted model.

292. (Currently Amended) The non-transitory computer-readable medium of claim 291, ~~wherein the computer-executable instructions~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

us[[e]]ing the estimated values for the rate of return, standard deviation, other higher moments of interest and any other factors specified by a user for the asset, derived as output from said claims, as input to price or value other options contingent on the same or similar assets.

293. (Currently Amended) The non-transitory computer-readable medium of claim 273, wherein a user applies an option-theoretic model of the firm and ~~the computer-executable instructions:~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

determine[[e]]ing a plurality of input parameters, the parameters including a risk premium in the rate of return for each security issued by, or referenced to, the firm;

defin[[e]]ing relationships between said parameters;

fitting the model; and

provid[[e]]ing as output to a user parameters of interest to the user from the fitted model.

294. (Currently Amended) The non-transitory computer-readable medium of claim 293, ~~wherein the computer-executable instructions:~~further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

receiving data on features of the securities issued by, or referenced to, the firm;

receiving adjustments for any factors specified by a user;

specif[[y]]ing [[the]] a real world distribution process that the returns on the firm's assets are expected to follow;

specif[[y]]ing a default point representing the value of the firm's assets at which the firm is expected to default;

calculate[[e]]ing [[the]] an expected real world probability of the default point being met;

calculat[[e]]ing [[the]] an expected mean, standard deviation and other higher moments of interest of the securities being analysed, having regard to the real world distribution process modelled for the firm's assets and the default point, at [[the]] a time horizon of interest;

us[[e]]ing the expected mean value of the securities, at the time horizon of interest, and the securities' features ~~aforesaid parameters~~ to calculate [[the]] an expected real world pay off of the securities being analysed, at the time horizon of interest;

discounting back to present value (as at [[the]] a chosen evaluation date) the expected pay offs of each security being analysed using a risk adjusted discount rate, where said risk adjusted discount rate includes a risk premium for the expected standard deviation of the expected pay off from the security, for such other higher moments of interest to the user and adjustments for any other factors specified by a user, such that [[the]] a price per unit of risk, for each such risk factor, is equated for two or more securities issued by, or referenced to, the firm;

fitting the model; and

provid[[e]]ing as output to a user parameters of interest to the user from the fitted model.

295. (Currently Amended) The non-transitory computer-readable medium of claim 293, ~~wherein the computer-executable instructions:~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

defin[[e]]ing additional multi-variate equations representing relationships between variables, which comprise some or all of the inputs to and/or outputs from ~~variables used in~~ the model of claim 293; and

solv[[e]]ing all of the multi-variate equations and the said model to calculate revised values for the ~~remaining unknown~~ variables in the multi-variate equations and the model.

296. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations a statistical moment of one of the securities issued by, or referenced to the firm.

297. (Currently Amended) The non-transitory computer-readable medium in claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown~~

~~inputs~~ in one or more additional multi-variate equations [[the]] a correlation between the returns of a pair of securities issued by, or referenced to, the firm.

298. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] a covariance between the returns of a pair of securities issued by, or referenced to, the firm.

299. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] a correlation between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

300. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] a covariance between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

301. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] an expected probability of default.

302. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown inputs~~ in one or more additional multi-variate equations [[the]] an expected loss given default on a debt-type security issued by, or referenced to, the firm.

303. (Currently Amended) The non-transitory computer-readable medium of claim 295, wherein the computer-executable instructions include as at least one of the variables ~~unknown~~

~~inputs~~ in one or more additional multi-variate equations [[the]] an expected default loss on a debt-type security issued by, or referenced to, the firm.

304. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is a statistical moment of the returns of one of the securities issued by, or referenced to, the firm.

305. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a correlation between the returns of a pair of securities issued by, or referenced to, the firm.

306. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a covariance between the returns of a pair of securities issued by, or referenced to, the firm.

307. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a correlation between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

308. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the

computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] a covariance between the returns of a security issued by, or referenced to, the firm and the returns of the total firm.

309. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected probability of default.

310. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected loss given default on a debt-type security issued by, or referenced to, the firm.

311. (Currently Amended) The non-transitory computer-readable medium of claim 293, wherein the computer-executable instructions, upon execution by the computer, cause the computer to generate one or more parameters from the model and solve the model so that the said parameters equal values specified by a user, where one of the said parameters is [[the]] an expected default loss on a debt-type security issued by, or referenced to, the firm.

312. (Currently Amended) The non-transitory computer-readable medium of claim 291, wherein computer-executable instructions, upon execution by the computer, cause the computer to model the real world distribution process that the returns on the firm (or underlying asset) are expected to follow as a specified statistical distribution, wherein the mean, standard deviation and other higher moments of interest of [[the]] portions of that distribution relevant to a security

are estimated using closed-form type formula solutions or numerical approximations appropriate for the specified statistical distribution process.

313. (Currently Amended) The non-transitory computer-readable medium of claim 294, wherein computer-executable instructions, upon execution by the computer, cause the computer to model the real world distribution process that the returns on the firm (or underlying asset) are expected to follow as a specified statistical distribution, wherein the mean, standard deviation and other higher moments of interest of [[the]] portions of that distribution relevant to a security are estimated using closed-form type formula solutions or numerical approximations appropriate for the specified statistical distribution process.

314. (Currently Amended) The non-transitory computer-readable medium of claim 312, wherein the computer-executable instructions, upon execution by the computer, cause the computer to model the real world ~~statistical~~ distribution process that the returns on the firm (or underlying asset) are expected to follow as the normal distribution.

315. (Currently Amended) The non-transitory computer-readable medium of claim 313, wherein the computer-executable instructions, upon execution by the computer, cause the computer to model the real world ~~statistical~~ distribution process that the returns on the firm (or underlying asset) are expected to follow as the normal distribution.

316. (Currently Amended) The non-transitory computer-readable medium of claim 315, wherein the firm has, or is treated as having, only a single class of zero coupon debt on issue, and further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a promised yield on the firm's debt, per annum (y),

a risk free rate of return, per annum (r),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

a standard deviation of rates of return on the firm's debt, per annum (σ_B),

a standard deviation of rates of return on the firm's equity, per annum (σ_S);

calculating values for d_1 and d_2, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T};$$

calculating values for:

$$\ln\left(\frac{V_0 e^{r_V T}\left[1 - N(d_1)\right] + B_0 e^{yT} N(d_2)}{B_0} \right) \Big/ T - r \Big/ \sigma_B, \text{and}$$

$$\ln\left(\frac{V_0 e^{r_V T} N(d_1) - B_0 e^{yT} N(d_2)}{S_0} \right) \Big/ T - r \Big/ \sigma_S$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 or d_2 as the upper limit; and

~~the computer-executable instructions~~ fitting the model such that:

$$\frac{\ln\left(\frac{V_0 e^{r_V T}\left[1-N(d_1)\right]+B_0 e^{yT}N(d_2)}{B_0}\right)\Big/T-r}{\sigma_B}=\frac{\ln\left(\frac{V_0 e^{r_V T}N(d_1)-B_0 e^{yT}N(d_2)}{S_0}\right)\Big/T-r}{\sigma_S}.$$

317. (Currently Amended) A non-transitory computer-readable medium ~~having computer-executable instructions~~ for ~~performing a method to~~ applying an option-theoretic model of a firm, ~~said method~~ bearing computer-executable instructions that, upon execution by a computer, cause the computer to perform operations comprising:

specifying values for risk parameters, determining a plurality of input parameters, defining relationships between said input parameters, creating a computer implemented option-theoretic model of the firm, inputting the input parameters to the model, estimating ~~the steps of generating~~ one or more risk parameters from the model, measured ~~estimated~~ over a discrete time period, [[and]] solving the model so that the ~~said~~ estimated risk parameters equal the values specified by a user, and storing the solution to the model in a computer memory.

318. (Currently Amended) The non-transitory computer-readable medium of claim 317, wherein one of the said risk parameters analysed by the computer-executable instructions is a statistical moment of [[the]] returns of one or more [[of the]] securities issued by, or referenced to, the firm.

319. (Currently Amended) The non-transitory computer-readable medium of claim 317, wherein one of the said risk parameters analysed by the computer-executable instructions is [[the]] a correlation between [[the]] returns of a pair of securities issued by, or referenced to, the firm.

320. (Currently Amended) The non-transitory computer-readable medium of claim 317, wherein one of the said risk parameters analysed by the computer-executable instructions is [[the]] a covariance between [[the]] returns of a pair of securities issued by, or referenced to, the firm.

321. (Currently Amended) The non-transitory computer-readable medium of claim 317, wherein one of the said risk parameters analysed by the computer-executable instructions is [[the]] a correlation between [[the]] returns of a security issued by, or referenced to, the firm and [[the]] returns of the total firm.

322. (Currently Amended) The non-transitory computer-readable medium of claim 317, wherein one of the said risk parameters analysed by the computer-executable instructions is [[the]] a covariance between [[the]] returns of a security issued by, or referenced to, the firm and [[the]] returns of the total firm.

323. (Currently Amended) The non-transitory computer-readable medium of claim 293, ~~wherein the computer-executable instructions use formula for calculating additional parameters, being instantaneous volatility, for calibration with the model, said formula comprising~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

receiving values for:

a value of the equity of the firm at time n (S_n),

a value of the firm's assets at time n (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a rate of return on the firm's equity, per annum (r_S),

a rate of return on the firm's debt, per annum (r_B),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

calculating a value for d_1, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

calculating a value for an instantaneous standard deviation of rates of return on the firm's debt, per annum (σ_B), using the formula:

$$\sigma_B = \sigma_V \frac{V_0}{B_0} e^{(r_V - r_B)T} \left[1 - N(d_1)\right]$$

;and/or

calculating a value for an instantaneous standard deviation of rates of return on the firm's equity, per annum (σ_S), using the formula:

$$\sigma_S = \sigma_V \frac{V_0}{S_0} e^{(r_V - r_S)T} N(d_1);$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 as the upper limit; and

using one or both said values of instantaneous standard deviation to fit the option-theoretic model of the firm.

324. (Currently Amended) The non-transitory computer-readable medium of claim 317, ~~wherein the computer-executable instructions use formula for calculating additional parameters, being instantaneous volatility, for calibration with the model, said formula comprising:~~ further

bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

receiving values for:

a value of the equity of the firm at time *n* (S_n),

a value of the firm's assets at time *n* (V_n), wherein the value of the firm's assets is the sum of values of the firm's debt (B_n) and equity (S_n),

a face value (X) of the firm's debt (B), which is assumed to be a single zero-coupon bond, at maturity,

a user selected time horizon, in years (T),

a rate of return on the firm's assets, per annum (r_V),

a rate of return on the firm's equity, per annum (r_S),

a rate of return on the firm's debt, per annum (r_B),

a standard deviation of rates of return on the firm's assets, per annum (σ_V),

calculating a value for d_1, wherein:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T} \right),$$

calculating a value for an instantaneous standard deviation of rates of return on the firm's debt, per annum (σ_B), using the formula:

$$\sigma_B = \sigma_V \frac{V_0}{B_0} e^{(r_V - r_B)T} \left[1 - N(d_1) \right]$$

;and/or

calculating a value for an instantaneous standard deviation of rates of return on the firm's equity, per annum (σ_S), using the formula:

$$\sigma_S = \sigma_V \frac{V_0}{S_0} e^{(r_V - r_S)T} N(d_1) \text{ ;}$$

where $N(.)$ is the cumulative probability of the standard normal distribution with d_1 as the upper limit; and

using one or both said values of instantaneous standard deviation to fit the option-theoretic model of the firm.

325. (Currently Amended) The non-transitory computer-readable medium of claim 293, ~~wherein the computer-executable instructions use formula for calculating additional parameters, being discrete time volatility, correlation and covariance, for calibration with the model, said formula comprising:~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

receiving user selection of one or more of the following parameters, to be calculated over discrete time, for calibration with the model:

a standard deviation of rates of return on the firm's debt, per annum (σ_B),

a standard deviation of rates of return on the firm's equity, per annum (σ_S),

a correlation of rates of return on the firm's debt and on the firm's equity (ρ_{BS}),

a correlation of rates of return on the firm's assets and on the firm's debt (ρ_{VB}),

a correlation of rates of return on the firm's assets and on the firm's equity (ρ_{VS}),

a covariance of rates of return on the firm's debt and on the firm's equity, per annum (σ_{BS}),

a covariance of rates of return on the firm's assets and on the firm's debt, per annum (σ_{VB}),

a covariance of rates of return on the firm's assets and on the firm's equity, per annum (σ_{VS}),

calculating values for the parameter or parameters so selected using one or more of the following formula:

$$\sigma_B = \sqrt{\ln\left(\frac{V_T^2[1-N(d_3)]e^{\sigma_V^2 T} + X^2 N(d_2)}{B_T^2}\right)\Big/T}$$

$$\sigma_S = \sqrt{\ln\left(\frac{V_T^2 N(d_3)e^{\sigma_V^2 T} - 2V_T XN(d_1) + X^2 N(d_2)}{S_T^2}\right)\Big/T}$$

$$\rho_{BS} = \frac{X - B_T}{B_T\sqrt{\left(e^{\sigma_S^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VB} = \frac{V_T[1-N(d_3)]e^{\sigma_V^2 T} + XN(d_1) - B_T}{B_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VS} = \frac{V_T N(d_3)e^{\sigma_V^2 T} - XN(d_1) - S_T}{S_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_S^2 T}-1\right)}}$$

$$\sigma_{BS} = \rho_{BS}\sigma_B\sigma_S$$

$$\sigma_{VB} = \rho_{VB}\sigma_V\sigma_B$$

$$\sigma_{VS} = \rho_{VS}\sigma_V\sigma_S$$

wherein ~~the additional term is~~:

S_n is a value of the equity of the firm at time *n*,

V_n is a value of the firm's assets at time *n*,

B_n is a value of the debt of the firm at time *n*,

X is a face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity,

T is a user selected time horizon, in years,

r_V is a rate of return on the firm's assets, per annum,

σ_V is a standard deviation of rates of return on the firm's assets, per annum,

σ_S is a standard deviation of rates of return on the firm's equity, per annum,

σ_B is a standard deviation of rates of return on the firm's debt, per annum,

values for d_1, d_2 and d_3 are calculated using the formula:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T},$$

$$d_3 = d_1 + \sigma_V \sqrt{T}.$$

$N()$ is the cumulative probability of the standard normal distribution with d_1, d_2 or d_3 as the upper limit;

prior to calculating values of the selected parameter or parameters, receiving such of the following that are necessary to undertake the said calculations using the said formula:

a value of the equity of the firm at time *n*,

a value of the firm's assets at time *n*,

a value of the debt of the firm at time *n*,

a face value of the firm's debt,

a user selected time horizon, in years,

a rate of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's equity, per annum,

a standard deviation of rates of return on the firm's debt, per annum; and

using one or more of the values of the selected parameters so calculated to fit the option-theoretic model of the firm.

326. (Currently Amended) The non-transitory computer-readable medium of claim 317, ~~wherein the computer-executable instructions use formula for calculating additional parameters, being discrete time volatility, correlation and covariance, for calibration with the model, said formula comprising:~~ further bearing computer-executable instructions that, upon execution by the computer, cause the computer to perform operations comprising:

receiving user selection of one or more of the following parameters, to be calculated over discrete time, for calibration with the model:

a standard deviation of rates of return on the firm's debt, per annum (σ_D),

a standard deviation of rates of return on the firm's equity, per annum (σ_E),

a correlation of rates of return on the firm's debt and on the firm's equity (ρ_{DE}),

a correlation of rates of return on the firm's assets and on the firm's debt (ρ_{VD}),

a correlation of rates of return on the firm's assets and on the firm's equity (ρ_{VE}),

a covariance of rates of return on the firm's debt and on the firm's equity, per annum (σ_{DE}),

a covariance of rates of return on the firm's assets and on the firm's debt, per annum (σ_{VB}),

a covariance of rates of return on the firm's assets and on the firm's equity, per annum (σ_{VS}),

calculating values for the parameter or parameters so selected using one or more of the following formula:

$$\sigma_B = \sqrt{\ln\left(\frac{V_T^2[1-N(d_3)]e^{\sigma_V^2 T} + X^2 N(d_2)}{B_T^2}\right)\Big/ T}$$

$$\sigma_S = \sqrt{\ln\left(\frac{V_T^2 N(d_3)e^{\sigma_V^2 T} - 2V_T XN(d_1) + X^2 N(d_2)}{S_T^2}\right)\Big/ T}$$

$$\rho_{BS} = \frac{X - B_T}{B_T\sqrt{\left(e^{\sigma_S^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VB} = \frac{V_T[1-N(d_3)]e^{\sigma_V^2 T} + XN(d_1) - B_T}{B_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_B^2 T}-1\right)}}$$

$$\rho_{VS} = \frac{V_T N(d_3)e^{\sigma_V^2 T} - XN(d_1) - S_T}{S_T\sqrt{\left(e^{\sigma_V^2 T}-1\right)\left(e^{\sigma_S^2 T}-1\right)}}$$

$$\sigma_{BS} = \rho_{BS}\sigma_B\sigma_S$$

$$\sigma_{VB} = \rho_{VB}\sigma_V\sigma_B$$

$$\sigma_{VS} = \rho_{VS}\sigma_V\sigma_S$$

where~~in the additional term is~~:

S_n is a value of the equity of the firm at time *n*,

V_n is a value of the firm's assets at time *n*,

B_n is a value of the debt of the firm at time *n*,

X is a face value of the firm's debt (*B*), which is assumed to be a single zero-coupon bond, at maturity,

T is a user selected time horizon, in years,

r_V is a rate of return on the firm's assets, per annum,

σ_V is a standard deviation of rates of return on the firm's assets, per annum,

σ_E is a standard deviation of rates of return on the firm's equity, per annum,

σ_B is a standard deviation of rates of return on the firm's debt, per annum,

values for d_1, d_2 and d_3 are calculated using the formula:

$$d_1 = \left(\left[\ln\left(V_0 / X \right) + r_V T \right] \Big/ \sigma_V \sqrt{T} \right) + (1/2)\left(\sigma_V \sqrt{T}\right),$$

$$d_2 = d_1 - \sigma_V \sqrt{T},$$

$$d_3 = d_1 + \sigma_V \sqrt{T},$$

N() is the cumulative probability of the standard normal distribution with d_1, d_2 or d_3 as the upper limit;

prior to calculating values of the selected parameter or parameters, receiving such of the following that are necessary to undertake the said calculations using the said formula:

a value of the equity of the firm at time *n*,

a value of the firm's assets at time *n*,

a value of the debt of the firm at time *n*,

a face value of the firm's debt,

a user selected time horizon, in years,

a rate of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's assets, per annum,

a standard deviation of rates of return on the firm's equity, per annum,

a standard deviation of rates of return on the firm's debt, per annum; and

using one or more of the values of the selected parameters so calculated to fit the option-theoretic model of the firm.

327. (Cancelled)

328. (Withdrawn) A computer-readable medium having stored thereon the output from the process of claim 171.

329. (Withdrawn) A computer-readable medium having stored thereon the output from the process of claim 173.

330. (Withdrawn) A computer-readable medium having stored thereon the output from the process of claim 180.

331.-332. (Cancelled)

333. (Withdrawn) A computer-readable medium having stored thereon the output from operating the system of claim 225.

334. (Withdrawn) A computer-readable medium having stored thereon the output from operating the system of claim 227.

335. (Withdrawn) A computer-readable medium having stored thereon the output from operating the system of claim 234.

336.-337. (Cancelled)

338. (Withdrawn) A computer-readable medium having stored thereon the output from executing the computer-executable instructions of claim 279.

339. (Withdrawn) A computer-readable medium having stored thereon the output from executing the computer-executable instructions of claim 281.

340. (Withdrawn) A computer-readable medium having stored thereon the output from executing the computer-executable instructions of claim 288.

341.-342. (Cancelled)

343. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on output from the process of claim 171.

344. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on output from the process of claim 173.

345. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on output from the process of claim 180.

346.-347. (Cancelled)

348. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from operating the system of claim 225.

349. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from operating the system of claim 227.

350. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from operating the system of claim 234.

351.-352. (Cancelled)

353. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from executing the computer-executable instructions of claim 279.

354. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from executing the computer-executable instructions of claim 281.

355. (Withdrawn) A computer-readable medium having stored thereon an order to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from executing the computer-executable instructions of claim 288.

356.-357. (Cancelled)

358. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on output from the process of claim 171.

359. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on output from the process of claim 173.

360. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on output from the process of claim 180.

361.-362. (Cancelled)

363. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from operating the system of claim 225.

364. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from operating the system of claim 227.

365. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from operating the system of claim 234.

366.-367. (Cancelled)

368. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from executing the computer-executable instructions of claim 279.

369. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from executing the computer-executable instructions of claim 281.

370. (Withdrawn) A computer-readable medium having stored thereon a recommendation to buy or sell securities, or otherwise enter into a financial contract, based at least in part on the output from executing the computer-executable instructions of claim 288.

371. (Cancelled)